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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

CLARK, SHEILA V

ART UNIT

PAPER NUMBER

2815

DATE MAILED: 04/12/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.
09/640,961

Applicant(s)
Ma et al

Examiner
Sheila V. Clark

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2815



-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on Jan 4, 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 24-37 is/are pending in the application.
- 4a) Of the above, claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 24-37 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are objected to by the Examiner.
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

- 13) ☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).
- a) ☐ All b) ☐ Some* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- *See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

- 15) ☒ Notice of References Cited (PTO-892) 18) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 16) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 19) ☐ Notice of Informal Patent Application (PTO-152)
- 17) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s). 5 20) ☐ Other: _____

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The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

Claims 1-3 and 25-29, 31-34, 37 rejected under 35 U.S.C. 102(a) as being anticipated by Chung.

Chung et al teaches substantially all of the structural features recited in the claims wherein for example figure 6 Chung shows a microelectronic die 140 having an active top surface and at least one side and encapsulation 150 is shown adjacent one side and said encapsulation includes one lower shoulder surface substantially planar to the die active surface. A first dielectric 146 is shown resting on said shoulder of said encapsulation and is shown formed on said active surface and at least one conductive trace 134, 132, 110 (col. 10 , line 40-50 teaches use of same nickel material) is shown disposed on said first dielectric and in electrical contact with said active surface said die active surface and adjacent said encapsulation. An additional dielectric 120 is shown disposed over said one trace and said at least one trace extends through (132) and resides on (132 and 110) said at least one additional dielectric material layer. A bottom surface of said encapsulation is shown to be planar to the back surface of die 140.

Chung further teaches similar features in Figure 14 whereby Chung shows microelectronic dies 140, 180 and 190 having active top surfaces and at least one side and encapsulation 150 is shown adjacent one side and said encapsulation includes one top surface substantially planar to

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the die active surfaces. A first dielectric 120 is shown resting on said encapsulation and is shown formed on said active surface and at least one conductive trace 133, 132, 114 are shown disposed on said first dielectric and in electrical contact with said active surface and adjacent said encapsulation. An additional dielectric 610 is shown disposed over said one trace and said at least one trace is taught to extend through and resides on said at least one additional dielectric material layer. A bottom surface of said encapsulation is shown to be planar to the back surface of die 140.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 16, 26, 27, 31, 32 are rejected under 35 U.S.C. 102(b) as being anticipated by Fordemwalt et al.

Fordemwalt et al shows a microelectronic device 13 (or a plurality 13-16) having an active surface and an encapsulation 12 adjacent and planar to the die active surface. A first dielectric material 21 is formed on said active surface and at least one conductive trace 25 (22, 23, 24, 26) is taught to be disposed on said dielectric and in electrical contact with said active surface (see col. 4, lines 56-59).

Claims 1, 16, 26, 27 are rejected under 35 U.S.C. 102(a) as being anticipated by Nishihara et al.

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Nishihara et al shows a microelectronic device 1 having an active surface and an encapsulation 18 adjacent and planar to the die active surface. A first dielectric material 2 is formed on said active surface and at least one conductive trace 4 is taught to be disposed on said dielectric and in electrical contact with said active surface.

Claims 1, 4, 24, 26, 27, 30, 31, 32, 35, 36 are rejected under 35 U.S.C. 102(b) as being anticipated by Donovan.

Donovan shows a microelectronic die 12a (a plurality 12b, 12c) having an active top surface and at least one side and encapsulation 28 is shown adjacent one side and said encapsulation includes one surface substantially planar to the die active surface. A first dielectric 123 is shown disposed on said encapsulation and formed on said active surface and at least one conductive trace 32 is shown disposed on said first dielectric and in electrical contact with said active surface said die active surface and adjacent said encapsulation. At least one heat dissipation device 40 is shown in thermal contact with said microelectronic device back surface.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 4, 24, 35, and 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chung or Nishihara or Fordemwalt et al (as applied above) in view of Donovan et al.

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The features of the claims from which claims 4, 24, 35, and 36 depend have been discussed in detail supra except for use of a heat dissipation device in thermal contact with the bottom surface of the microelectronic chip. Donovan teaches a similar device to those of Chung or Nishihara or Fordemwalt et al and teaches the use of heat dissipation device 40 formed in thermal contact with the back of microelectronic device 12c (12 a and 12b). Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to use a heat dissipation device on the bottom surface of the electronic device. The ordinary artisan would have been motivated to modify Chung or Nishihara or Fordemwalt for the purposes of improving or increasing heat dissipation. Further providing the bottom surfaces of electronic devices with heat dissipation structures to improve heat dissipation is well known and performed conventionally in this art.

Claims 1-4, 24-37 are rejected.

Fillion et al, Saito et al and Japanese patents 5-206320, 1-217951 and 5-554409 are cited to show electronic devices having encapsulation planar to the active surface and at least one dielectric and conductive layer adjacent to said active surface.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner S.V. Clark whose telephone number is (703) 308-4924.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie Lee, can be reached on (703) 308-1690. The fax phone number for the organization where this application or proceeding is assigned is (703) 308-7722 or 7724.


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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

March 7, 2002


SHEILA V. CLARK
PRIMARY EXAMINER